

5-10 mm long; floral bracts broadly ovate, rounded with a thick apical cusp, slightly shorter than the sepals, coriaceous, even, glabrous, castaneous in age; flowers subsessile; sepals elliptic, 13 mm long, connate for 3 mm, nerved; petals and stamens unknown.

Type in the Gray Herbarium, collected on

trees, above Sibundoy, Territory of Putumayo, Colombia, altitude 2,280 meters, October 28, 1946, by M. B. and R. Foster (no. 1972).

Its stout geniculate floral axis distinguishes *Guzmania geniculata* from the group of species around *G. sphaeroidea* (André) André ex Mez where it shows its closest affinity.

ENTOMOLOGY.—*A review of the genus Tegenaria in North America (Arachnida: Agelenidae).*¹ VINCENT D. ROTH, Oregon State College. (Communicated by C. W. Sabrosky.)

This review is not intended to be a complete taxonomic discussion of the Nearctic *Tegenaria* but aims to clarify the position of the many names used in this genus. The area under consideration is that part of North America north of and including Mexico. This study was stimulated by Roewer's *Katalog der Araneae*, in which he lists 16 species of *Tegenaria* from the Nearctic region. Since its publication, one more species has been added. Of the total, five are recognized as valid, three are questionable species, one probably does not belong to the Agelenidae, four are placed in synonymy, and four are true calymmarids.

Keys and notes are furnished for the separation of the recognized species, and the remaining species are discussed briefly. The female epigynum for two of the species is illustrated for the first time.

The species of North American *Tegenaria* are identified by the following characteristics: size moderate to long, varying from 6 to 17 mm in length; color usually tan to

brown with darker markings; integument of carapace, legs, and abdomen densely to sparsely covered with white to brown plumose hair; carapace similar in shape to other Agelenae, pars cephalica narrowed to about one-half the width of the pars thoracica; eyes similar in size; chelicerae slightly to strongly geniculate, promargin bears 3 to 6 teeth, the retromargin 3 to 6 teeth and none to 2 or 3 denticles; legs moderately long with scattered spines; spinnerets subapical in position; anterior and posterior spinnerets widely separated, the latter situated laterally and slightly dorsally to the median spinnerets; distal segment of the anterior spinnerets small, hemispherically shaped; median spinnerets almost as long as anterior spinnerets; basal segment of posterior spinnerets as long as anterior spinnerets, distal segment as long as the basal segment, slender and tapering distally. The following key will separate the *Tegenaria* from other North American Agelenidae:

¹ Published with the approval of the Oregon State Monographs Publication Committee. Research Paper 201, School of Science, Department of Entomology. Supported in part by a grant from the Oregon Academy of Science.

Unless otherwise indicated all specimens have been collected by and are in the collection of the author. Abbreviations used with distributional records are: USNM, United States National Museum; AM, American Museum of Natural History; CAS, California Academy of Sciences; and HEF, the collection of Mrs. D. L. (Harriet Exline) Frizzell, of Rolla, Mo.

The author expresses his thanks to Dr. W. J. Gertsch, of the American Museum of Natural History, Dr. E. A. Chapin and Dr. W. D. Field, of the U. S. National Museum, and Mrs. Frizzell, all of whom generously supplied material and information. In addition many thanks are extended to Miss E. B. Bryant, of the Museum of Comparative Zoology, and E. Browning, of the British Museum (Natural History), for information concerning certain types.

1. Plumose hair present on carapace, abdomen, and legs (visible with 30-100 X magnification). (The hairs are often scarce on specimens that have been shaken about in alcohol for many years.) (AGELENEAE) 2
- Plumose hair absent on carapace and abdomen; hair either setose or barbed (*Cybacota*) other AGELENEAE
2. Anterior eye row almost straight; anterior median eyes located between the anterior lateral eyes *Tegenaria*
- Anterior eye row strongly procurved; anterior median eyes located, more or less, between the posterior lateral eyes other AGELENEAE

The following key to the species of North American *Tegenaria* is adaptable to both immature and adult spiders:

1. Promargin of chelicera with 3 teeth 2
- Promargin of chelicera with 4 to 6 teeth, oe-

- casionally 3 on one side but never on both sides.....4
2. Retromargin with 3 or 4 teeth and no denticles (cosmopolitan).....*domestica* (Clerck)
- Retromargin with 4 to 6 teeth and 2 or 3 denticles.....3
3. Sternum with 3 or occasionally 2 pairs of distinct, round, light spots laterally; conductor of male palpus ending with a single spur; epigynum bearing 2 broad lateral spurs (Pacific Northwest).
- gigantea* Chamberlin and Ivie <fl.
- Sternum usually lacking paired light round spots, if present, indistinct; conductor of male palpus terminated by 2 long pointed teeth; epigynum lacking lateral spurs (Pacific Northwest, Europe).
- agrestis* (Walckenaer) <fe
4. Sternum with two pair of light round spots laterally and a median mark which is tridentate posteriorly (southern U. S. from California to Alabama).....*antrias* Crosby
- Sternum lacking paired, light round spots (southern Mexico) *flexuosa* O. P. Cambridge

RECOGNIZED NORTH AMERICAN SPECIES OF
TEGENARIA

Tegenaria agrestis (Walckenaer)

Aranea agrestis Walckenaer, 1802: 216 (♂ ♀).
Tegenaria magnacava Exline, 1936: 23, fig. 5 (♀).
Tegenaria magnacava Exline, Chamberlin and Ivie, 1937: 213 (synonymy suggested at this time).
Tegenaria agrestis Walckenaer, Exline 1951: 308-310, figs. 1-5 (♂ ♀).
 For complete synonymy and references consult Roewer, 1944: 24.

Color: Sternum yellowish orange, with two dusky markings extending from the lateral edges of the labium, posteriorly to opposite the third coxae where the lines fade out. On immature specimens the dusky markings are darker, outlining three pairs of light, round spots laterally and a median light line. Legs lack dusky annulations.

Chelicera: Promargin armed with 3 teeth; retromargin bearing 4 or 5 teeth and 2 or 3 denticles.

Size: Males (2) 9.5 and 10.3 mm; female (1) 12.7 mm.

Distribution: Europe. Seattle, Wash. OREGON: Corvallis, Aug. 29, 1947 (♂ ♀), May 18, 1949 (imm.), April 16, 1951 (imm.).

Type locality: The female holotype of *T. magnacava* Exline from Seattle, Wash., has been placed in the Museum of Comparative Zoology at Harvard University. The type locality of *T. agrestis* Walckenaer was probably France. The original description was not available to author.

Tegenaria antrias Crosby

Tegenaria antrias Crosby, 1926: 2, fig. 3 (♀).
Tegenaria simplex Bryant, 1936: 90, fig. 9 (♀) (n. syn.).
Tegenaria castro Chamberlin and Ivie, 1942: 21, figs. 27-29 (♂ ♀) (n. syn.).

The author has had on hand males and females from the type localities of *T. antrias* Crosby and *T. simplex* Bryant, and a female from the type locality of *T. castro* Chamberlin and Ivie. There are no significant differences in structure or color, only the minor variations one finds in long series. Miss Bryant graciously compared the type of *T. simplex* Bryant with specimens from the three type localities and declared them identical.

Color: Sternum dusky with a median light band, trifurcate on the posterior half. Anterior portion flanked by two light spots on either side. Legs with dusky annulations, darkest on legs IV, becoming lighter on the anterior legs, indistinct on legs I.

Chelicera: Promargin armed with 4 teeth, occasionally 3 or 5 on one side. Retromargin with 3 to 5 teeth, the mesal two teeth often fused at base.

Size: Males (7) range in size from 5.5 to 10.1 mm, averaging 7.5 mm; females (15) 5.3 to 10 mm, averaging 7.2 mm.

Distribution: Southern United States from Alabama to California and north to Sacramento, Calif. It is also probably present in northern Mexico. NEW MEXICO: Carlsbad Caves, 1941, no other data (♂ ♀), USNM; CALIFORNIA: Sacramento, May 27, 1918, H. Van Duzee (2 ♀), CAS; San Francisco, R. F. Sternitsky (3 ♀), AM; Castro Valley, Alameda County, Sept. 16, 1938, W. M. Pearce (3 ♀), AM; Nov. 11, 1938, W. M. Pearce (♀), Feb. 26, 1939, W. M. Pearce (imm.), AM; TEXAS: 3-4 miles west of Dallas, 1935-37, Ottys Sanders (♀), AM; Austin, Nov. 25, 1945, D. L. and H. E. Frizzell (2 ♂, 7 ♀), HEF, April 27, 1946, D. L. and H. E. Frizzell (3 ♀), HEF; ALABAMA: Mobile, 1941, Archer (♂ ♀), AM. In addition one specimen (♀) labeled "Altoona, Pennsylvania" is in the collection at the United States National Museum. This is undoubtedly mislabeled.

Type locality: Female type of *Tegenaria antrias* Crosby from Carlsbad Caves, N. Mex. This type is supposedly deposited in the United States National Museum, but the author was unable to locate it during a visit in the summer of 1950. Female holotype of *T. simplex* Bryant from Dallas, Tex., is deposited in the Museum of

Comparative Zoology at Harvard University. The female holotype of *T. castro* Chamberlin and Ivie from Castro Valley, Alameda County, Calif., male allotype from Lindsay, Okla., both in the University of Utah collection.

Tegenaria domestica (Clerck)

Araneus domesticus Clerck, 1757: 76, fig. 9 (♀).

Tegenaria detestabilis O. P. Cambridge, 1877: 275 (♀) (n. syn.).

T. derhami Scopoli, Exline, 1938: 24-25, figs. 25-26 (♂♀).

T. derhamii Scopoli, Kaston, 1948: 279-280, figs. 895-899, 2053-2055 (♂♀).

For complete synonymy and references consult Roewer, 1944: 31.

T. detestabilis O. P. Cambridge was described from one female which, "had been damaged by an attempt at preservation in turpentine, whereby the eyes were concealed. . . For the same reason the exact form of the genital aperture was scarcely plain." At the request of the author, E. Browning, of the British Museum, graciously cleaned the type and forwarded an exceptionally clear illustration of the external epigynum which compares favorably with that of *T. domestica* (Clerck).

Color: Sternum varies from a yellowish brown with no markings to a dark brown with a pale

median line flanked with two or three pale spots. Legs variable, usually with dusky annulations, occasionally without.

Chelicera: Promargin armed with 3 teeth, retromargin usually armed with 4 teeth, occasionally 3.

Size: Males (9) range in size from 6.1 to 8.5 mm, averaging 6.84 mm; females (11) 6.3 to 8.9 mm, averaging 7.53 mm.

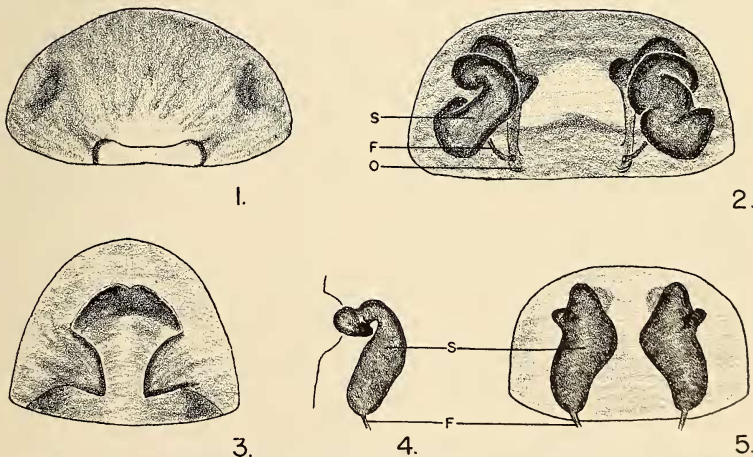
Distribution: Cosmopolitan. In the area considered in this paper, *T. domestica* (Clerck) has been collected from northern Canada (lat. 79° N., long. 74° W. on the east coast of Ellesmere Island, the type locality of *T. detestabilis* O. P. Cambridge) to southern Mexico (Uruapan, Michoacán, September 17, 1943, M. Cárdenas (♂), AM) and from the Pacific to the Atlantic coasts.

Tegenaria flexuosa F. O. Pickard-Cambridge

Figs. 1, 2

Tegenaria flexuosa F. O. Pickard-Cambridge, 1897-1905: 334, figs. 34-34a. (♂).

T. flexuosa F. O. Pickard-Cambridge was described from a single male and two immature females from Omilteme in Guerrero, Mexico. Several mature females from southern Mexico were studied for the present review.



FIGS. 1, 2.—*Tegenaria flexuosa* F. O. Pickard-Cambridge: 1, Female epigynum, ventral view; 2, female epigynum (cleared) dorsal view. (S, spermatheca; F, fertilization duct; O, opening of the epigynum.)

FIGS. 3-5.—*Tegenaria gigantea* Chamberlin and Ivie: 3, Female epigynum, ventral view; 4, lateral view of spermatheca; 5, female epigynum (cleared), dorsal view. (S, spermatheca; F, fertilization duct.)

Color: Sternum dark brown with a light-brown rectangular mark extending from the base of the labium to the middle of the sternum where it narrows to form a slender, light mark to the posterior edge. Median mark absent in the lighter colored specimens. Legs with dusky annulations which become lighter distally. They are darkest on the first pair of legs, becoming successively lighter on the posterior pairs.

Chelicera: Promargin of chelicera armed with 4 teeth, retromargin armed with 5 or 6 teeth and 2 or 3 denticles.

Epigynum: The external epigynum is quite simple and lacks heavy sclerotization as is usually present in *Tegenaria*. The most evident structure is a transverse subrectangular median sclerite, in front of which is a whitish, membranous area. Barely visible through the integument are parts of the spermathecae lying at a 45° angle from the lateral anterior edges of the median sclerite.

The internal epigynum consists of two separate halves. One side is herewith described. The transparent connecting canal arises along the lateral edge of the median sclerite and extends dorsally to the spermatheca. The latter consists of a heavily sclerotized tube, strongly twisted, and folded back upon itself at two points as illustrated in figure 2. A slender fertilization duct arises posteriorly along the mesal edge of the spermatheca and curves dorsally.

Size: Male (type) 7 mm; females (3) range in size from 7 to 9.8 mm.

Distribution: All recorded specimens and specimens seen by the author have been collected within a 180-mile radius from Mexico City, Mexico. MORELOS, Cuernavaca, Sept. 1941, H. Wagner (♀), AM; SAN LUIS POTOSÍ, Tamazunchale, July 6-7, 1941, L. I. Davis (♀), AM; MÉXICO, Tenancingo, Sept. 27-Oct. 7, 1946, H. Wagner (♀); GUERRERO, Parque Humboldt near Taxco, 2,500 m., Dec. 26, 1943, C. Bolívar, C. Tellez (imm.), AM; FEDERAL DISTRICT, Desierto de los Leones, Mar. 12, 1944, M. Cárdenas (imm.) AM.

Type locality: A male type and two immature females were collected at Omilteme, Guerrero, in Mexico and are deposited in the collection of F. D. Godman and O. Salvin at the British Museum.

Tegenaria gigantea Chamberlin and Ivie

Figs. 3-5

Tegenaria gigantea Chamberlin and Ivie, 1935: 31, fig. 106 (♂).

T. gigantea Chamberlin and Ivie, Exline, 1936: 21, fig. 3 (♂).

T. gigantea Chamberlin and Ivie, Exline, 1938: 25, figs. 30-31 (♂).

Color: Sternum dark brown with a pale median stripe arising at base of labium, expanding slightly and then narrowing posteriorly. Three pale spots lie laterally to the median line. Occasionally the posterior spot nearly connects with the median line forming a tridentate mark. Legs lack annulations. Male femur in this species often a very dark brown, contrasting with the yellowish brown of the other legs.

Chelicera: Promargin armed with 3 teeth; retromargin teeth variable, usually 5 or 6 teeth, occasionally 4 and 2 or 3 denticles.

Epigynum: The female of *T. gigantea* Chamberlin and Ivie was never described or illustrated, although female paratypes were designated. The following description of the epigynum was taken from females collected at the type locality.

The external epigynum consists of an irregular, convex median sclerite widened posteriorly. At each of the lateral edges is a depression and the opening of the spermathecae. Two broad, flat spurs extend over the lateral edges of the median sclerite toward the median line. The dull points of the spurs end at the three-quarter mark from the anterior end of the median sclerite.

Internally the strongly sclerotized epigynum is quite simple and slightly asymmetrical. One half is herewith described. The spermatheca consists of an irregular tube lying longitudinally and curving ventrally at the external opening where it is slightly constricted. The distal portion between the opening and the main portion of the spermatheca is bulbous and bears a short and blunt lateral projection as illustrated in Fig. 4.

Size: Males (12) range in size from 9.1 to 15 mm, averaging 12.02 mm; females (10) 11.8 to 17 mm, averaging 13.93 mm.

Distribution: Found only on the southern half of Vancouver Island, British Columbia. Many males and females from "Vancouver Island" collected by R. Guppy from May to October are in the American Museum of Natural History in New York City.

The male holotype was collected on "Vancouver Island," British Columbia, female allotype at Sidney, a small town 14 miles north of Victoria, British Columbia. Both types are deposited in the University of Utah.

STATUS OF OTHER "TEGENARIA" LISTED IN
ROEWER'S "KATALOG DER ARANEAE"

Tegenaria arboricole Walckenaer

Abbot, 1792: 12, figs. 109, 110.

Tegenaria arboricole Walckenaer, 1841: 6 (♂).
Fig. 110 of Abbot's.

T. nemorensis Walckenaer, 1841: 10-11 (in part,
variety 2) (♀). Fig. 109 of Abbot's.

T. arboricole Walckenaer, Chamberlin and Ivie,
1944: 128-129.

Chamberlin and Ivie (1944: 128-129) state,
"It (Abbot's figure) is undoubtedly an Agelenid,
but we are not certain of the genus so leave it in
Tegenaria for the present."

Type locality: Georgia. Abbot's figure 110 was
used as the basis for the description of *T. arbori-*
cole Walckenaer. There apparently was no speci-
men on hand at the time the description was
drawn up.

Tegenaria flavens Hentz

Tegenaria? *flavens* Hentz, 1847: 464, fig. 22 (♀).

After studying the illustration of *T. flavens*
Hentz Dr. W. J. Gertsch stated, through cor-
respondence, "*Tegenaria flavens* does not belong
to the genus and probably not even to the fam-
ily." The author is inclined to agree with him.

Type locality: Alabama. The type has appar-
ently been lost.

Tegenaria nemorensis Walckenaer

See *T. arboricole* Walckenaer and *Coras medi-*
cinalis (Hentz).

Type locality: "Georgia." Abbot's figures 107
to 109 were used as the basis for the description
of *T. nemorensis* Walckenaer. There were appar-
ently no specimens on hand at the time of the
description.

Tegenaria obscura Banks

Tegenaria obscura Banks, 1898: 230-231, fig. 26 (♀).

Tegenaria obscura Banks was described from a
single female from "San Miguel de Horecasitas."
This is probably the river which is now named
Río de San Miguel, whose headwaters are about
28 miles southeast of Nogales, Ariz., in Mexico.
The type was deposited in the California Acad-
emy of Sciences and was apparently lost during
the San Francisco fire and earthquake of 1906.
This species is close to and probably identical
with *T. antrias* Crosby which has been collected
in the southwestern part of the United States.

Tegenaria praegrandis Fox

Tegenaria praegrandis Fox, 1937: 176-177, fig. 3 (♀).

Tegenaria praegrandis Fox was described from
a single female from "Washington D. C. Dept.
Grounds, Hothouse, outside" (Marx's catalog).
A species as large as this (13.96 mm) and with
the conspicuous habits of the genus would surely
be collected again in 56 years. (No date was
given, but Marx died in 1895.) In view of this
and the fact that Marx's locality labels have
often been found to be inaccurate, the author is
including this species under the "unrecognized
Tegenaria." The female is close to *T. gigantea*
Chamberlin and Ivie but the genitalia are defi-
nitely different. It will probably prove to be an
exotic species.

The type (no. 1255) is deposited in the United
States National Museum at Washington D. C.

Calymmaria cavicola (Banks)

Tegenaria cavicola Banks, 1896: 202-203 (imm.).

Calymmaria cavicola Banks, Chamberlin and Ivie,
1937: 213.

Tegenaria cavicola Banks, Roewer, 1944: 33.

Calymmaria cavicola Banks, Muma, 1945: 95.

Calymmaria modestella (Roewer)

Tegenaria modesta Banks, 1898: 230, fig. 21 (♀).
(Preoccupied by Keyserling 1877.)

Calymmaria modesta Banks, Chamberlin and Ivie,
1937: 213.

Tegenaria modestella Roewer, 1944: 33 (new name).

Calymmaria persica (Hentz)

Tegenaria persica Hentz, 1847: 463, fig. 23 (♀).

T. persica Hentz, Roewer, 1944: 33.

The type of *T. persica* Hentz has apparently
been lost but the illustration given by Hentz
indicated the probable genus. Dr. W. J. Gertsch
states through correspondence, "*Tegenaria per-*
sica Hentz is very clearly a *Calymmaria* and a
species occurs in Alabama (the type locality of
T. persica Hentz) which I have not been able
to differentiate from (*Calymmaria*) *cavicola*
Banks."

Calymmaria quadrata (Exline)

Tegenaria quadrata Exline, 1936: 22, fig. 4 (♀).

Calymmaria quadrata Exline, Chamberlin and Ivie,
1937: 213.

Tegenaria quadrata Exline, Roewer, 1944: 33.

Coras medicinalis (Hentz)

Abbot, 1792: 12, figs. 107-108 (♂ ♀).

Tegenaria medicinalis Hentz, 1821: 53, figs. 1a, 1b.

Tegenaria nemorensis Walckenaer, 1841: 10-11 (in
part, varieties 1 and 3) (♂ ♀). Figs. 107-108 of
Abbot's.

Coras medicinalis Hentz, Chamberlin and Ivie 1944: 129.
Coras medicinalis Hentz, Roewer, 1944: 20.
Tegenaria nemorensis Walckenaer, Roewer, 1944: 33.
Coras medicinalis Hentz, Muma, 1946: 4-5, figs. 1-3, 21-24 (♂ ♀).
Coras medicinalis Hentz, Kaston. 1948: 281-282, figs. 900-902, 1914-1915 (♂ ♀).
 See Roewer, 1944: 20 for additional synonymy.

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ENTOMOLOGY.—*Johnsonaeapsylla audyi*, a new genus and new species of flea from North Borneo, with notes on the subfamily Leptopsyllinae (Siphonaptera).¹
 ROBERT TRAUB, Lt. Col., M.S.C., Army Medical Service Graduate School, Washington, D. C.

In connection with studies on the epidemiology of scrub typhus and leptospirosis, a joint U. S. Army-British Colonial Office Medical Research Team operated in North Borneo in July and August 1951. During the course of these investigations, fleas, mites, and other ectoparasites were collected from small mammals, particularly on Mount Kinabalu. Among the material represented in the valuable collections is the unusual flea herein described as a new genus and

new species of the family Ceratophyllidae, subfamily Leptopsyllinae. Fleas of this subfamily are frequently true parasites of *Rattus*, as well as of *Mus* and other mice, and hence are of potential medical significance.

A discussion of the subfamily Leptopsyllinae is included in this paper because of recorded differences of opinion as to the systematic position of this important group of fleas and because the new genus makes necessary a reevaluation of the diagnostic characters of the subfamily. This genus also indicates relationship between the Leptopsyllinae and the Amphipsyllinae.

¹ Published under the auspices of the Surgeon General, Department of the Army, who does not necessarily assume responsibility for the professional opinions expressed by the author.